

Generative Commons and Realization Conditions: Non-Rival Forms, Effective Access, and Standing

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Abstract

A language, a research practice, or a body of technique is used without being consumed, and it is also transformed by the using. Speakers coin words, shift meanings, and change conventions, so a linguistic commons at one time is partly the product of its participants at earlier times. This makes such a commons a process rather than a pool, and it generates a difficulty. If participants continuously co-produce the commons' future states, everyone in it is in some sense a co-creator; and if relational coupling runs through arbitrarily long chains, no participant creates anything alone. Both observations are plausible, and together they appear to make co-creator status universal and therefore incapable of differentiating anyone from anyone. Yet contribution, maintenance, reliance, vulnerability, and control remain sharply differentiated in every actual commons. This paper argues for what survives that difficulty. It holds that a generative commons is constituted by a capacity to be transformed rather than by a stock of items, so that protecting it is ambiguous between preserving a state and sustaining that capacity, and the two can conflict. It holds that path connectivity through higher-order coupling establishes that isolated authorship is an idealization while establishing no co-creator standing, since a relation that holds universally can allocate nothing and the argument from relational ontology is self-undermining when used for allocation. It reconstructs and defends an argument that entry into a commons makes exclusive attribution progressively underdetermined, and that this defeats individual decomposition as a protection regime while leaving the continuation of the commons' generative capacity as the remaining coherent object, stating the argument as a conditional rather than as an inference from ignorance. It separates five predicates that are routinely run together — participation, contribution, standing, governance authority, and ownership — and argues that no pair among them stands in an entailment relation. And it identifies a form of enclosure that requires no exclusion: a controller can contract a commons' effective repertoire while every participant retains formal access, which is the commons analogue of retention with foreclosure. The paper supplies no ownership rule, no governance design, no contribution threshold, and no classification of any actual commons.

Keywords: generative commons; non-rivalry; realization conditions; enclosure; standing; attribution; collective production.

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Status and correspondence. This paper is a revisable discussion document. Its definitions are proposals, its formal results are conditional on declared assumptions, and its normative arguments are offered for assessment. Objections, counterexamples, corrections, alternative formulations, and relevant literature are welcome at huangwanhong@serendip.ngo.

Research genealogy. Four moves in this paper are researcher-origin. The rejection of a depletion-based commons analogy for language and knowledge, on the ground that use generally subtracts nothing from another’s possession. The observation that a commons is historically generative, so that participants continuously co-produce its later states and the question of co-creator status arises for everyone in it. The relational-ontology challenge to isolated authorship, on the ground that any participant couples to any other through possibly high-order chains. And the normative proposal that the justification for protecting a commons runs through the ambiguity of attribution after entry rather than through a claim that nobody created anything.

The process-against-stock formulation, the connectivity threshold argument, the reconstruction of the attribution argument as a conditional disjunctive elimination, the five-predicate separation, the enclosure-without-exclusion result, and every countermodel are agent-added.

Generative AI use. Generative AI systems were used in the preparation of this work. Anthropic’s Claude and OpenAI systems including ChatGPT and Codex supported exploratory discussion, formal reconstruction, source discovery followed by verification, and drafting in L^AT_EX. The author determined the research questions, theoretical commitments, and epistemic status of the claims and bears sole responsibility for the manuscript, including its errors. None of these systems is an author or holds authorship credit.

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1 Introduction

English is not a thing that speakers use. It is a practice they carry out, and carrying it out changes it. A speaker coins a word, a community shifts a meaning, a profession builds a vocabulary, a generation alters a pronunciation. The language at any time is partly the sediment of what its speakers did with it earlier. The same holds of a research tradition, a body of craft technique, a musical idiom, and an open software ecosystem. Each is used without being consumed, and each is transformed by the using.

This makes such a commons a strange object for any theory of appropriation. The familiar commons of the economic literature is a pool with subtractable units, where the governance problem is congestion or depletion. Here nothing is subtracted, and the object itself moves. A participant who learns a practice and contributes to it is not drawing down a stock; the participant is a moment in the process by which the practice becomes its next state.

That observation generates the paper's difficulty. If participants continuously co-produce the commons' later states, then everyone within it is in some sense a co-creator of what it becomes. And if relational coupling runs through arbitrarily long chains, so that any participant is connected to any other through possibly high-order relations, then no participant ever created anything alone and the phrase *this person created that practice* is at best a convenient localization. Both observations are plausible. Together they appear to make co-creator status universal, and a status that everyone has cannot distinguish anyone from anyone.

Yet every actual commons is radically differentiated. Some participants maintain a practice while others merely inhabit it; some transform it while others reproduce it; some depend on it for their livelihood while others could walk away tomorrow; and some control the conditions under which it can be realized at scale while others control nothing. A theory that concludes *everyone is a co-creator, therefore everyone stands alike* has lost the distinctions that make the subject worth studying. A theory that concludes *no one is a creator, therefore no one has standing* has lost them in the other direction.

This paper argues for what survives. Five claims organize it.

The first concerns what kind of object a generative commons is. It is constituted by a capacity to be transformed rather than by a stock of items, which has an immediate and underappreciated consequence: protecting it is ambiguous between preserving a state and sustaining the capacity, and the two can conflict. A practice frozen to preserve it has been destroyed in the respect that made it valuable.

The second concerns the relational-ontology argument. It is true and it proves too much. Path connectivity through higher-order coupling shows that isolated authorship is an idealization; it establishes no co-creator standing, because connectivity holds universally and by definition allocates nothing. An argument that yields the same verdict for everyone cannot ground a differential claim, so appeals to relational genesis are self-undermining when used for allocation. What differentiates must be effective causal influence, which admits degrees and thresholds that mere connectivity does not.

The third reconstructs the paper's central normative move, which is researcher-origin and requires careful statement. The proposal is that the justification for protecting a commons runs through the ambiguity of attribution after entry, rather than through a claim that nobody created anything. Stated carelessly, this infers a value from an ignorance. Stated carefully, it is a disjunctive elimination: the commons' continuing generative capacity is valuable on independent grounds; two candidate regimes might protect what is valuable here, namely decomposition into individual entitlements or protection of the continuing capacity; attribution underdetermination defeats the first; so the second is the remaining coherent object of protection. The conclusion is conditional. It

establishes what protection must attach to if there is to be protection, and it does not establish that there must be.

The fourth separates five predicates that are run together with striking regularity: participation in a practice, contribution to it, standing to be wronged by what happens to it, authority to govern it, and ownership of it. No pair among these stands in an entailment relation, and the paper exhibits the counterexamples pairwise. Most bad arguments in this area consist of sliding along that list.

The fifth identifies a form of enclosure requiring no exclusion. Because a generative commons is constituted by a transformation capacity realized through conditions, a controller can contract that capacity while every participant retains formal access to the practice. Nobody is shut out; what contracts is what the practice can become. This is the commons analogue of an asymmetry the companion diagnostic states for individuals, and it explains why access-based tests are the wrong instrument for the harm at issue.

The paper's contribution is a set of separations and one conditional normative argument. It supplies no ownership rule, no governance design, no contribution threshold, and no classification of any actual commons, and it takes no position on whether any particular practice should be protected.

The argument proceeds in eight further sections. Section 2 constructs the commons object and states the process-against-stock result. Section 3 reviews commons, enclosure, and collective-production traditions. Section 4 argues the five theses. Section 5 develops the political economy of enclosure without exclusion. Section 6 supplies the formal results. Section 7 states countermodels. Section 8 collects open questions, and Section 9 states limits and defeat conditions.

The philosophical and formal parts are *formally independent*, since every proposition follows from declared assumptions and no derivation cites a thesis, and *justificatorily dependent*, since the formal results describe a structure whose interest rests on the arguments. Section 4.5 records what fails if each thesis is rejected.

2 The Commons Object and Its Scope

This section constructs the object the paper studies and distinguishes it from the commons of the economic literature. Its objective is to establish that the object is a process, and to draw the consequence for what protecting it could mean.

2.1 Two Kinds of Commons

This subsection separates the subtractable case from the generative case.

The commons analyzed in the common-pool tradition has subtractable units. A fishery, a pasture, and an irrigation system share the feature that use by one appropriator reduces what remains for others, and the governance problem is accordingly one of restraining appropriation and sustaining provision [12]. The design principles that literature identifies are answers to that problem.

A generative commons has no subtractable units in the relevant respect. A language, a proof technique, a musical idiom, and a body of craft knowledge are used without being diminished, which is the property that makes them nonrival inputs in the economic sense [15]. The extension of common-pool analysis to knowledge is deliberate and contested, and the volume that undertakes it treats the extension as a research programme rather than a settled transfer [9].

The present paper takes the extension seriously and identifies where it breaks. The break is not that knowledge fails to deplete. It is that a generative commons is altered by the activity that constitutes its use, and a pool is not.

2.2 The Commons as Process

This subsection states the paper’s first structural claim.

Write the commons at time t as G_t , the community of participants and their interactions as $\mathcal{R}_t$, and the realization conditions available to them as $\mathcal{C}_t$. The commons at the next period is produced by what participants do with it:

$$G_{t+1} \in \mathcal{U}(G_t, \mathcal{R}_t, \mathcal{C}_t, \xi_t), \quad (1)$$

where ξ_t collects influences the model does not resolve. The update is set-valued because the practice’s next state is underdetermined by its current state and its participants.

Equation (1) is the formal expression of an ordinary observation. Speakers of a language do not merely draw on a finished object; they produce the object’s later states. The same holds of a research tradition whose practitioners change what counts as a result, and of a craft whose practitioners change what counts as competent work.

Thesis 2.1 (Constitution by transformation capacity). A generative commons is constituted by a capacity to be transformed rather than by a stock of items. Protecting it is therefore ambiguous between preserving a state and sustaining the capacity, and these objectives can conflict.

The argument is that the identity conditions of such a commons refer to the process. Two communities could share every current item of a practice and differ in whether the practice can still be extended, and only one of them has what makes the practice valuable to its participants. Conversely a practice can change every item it contains across a period and remain the same commons, as languages routinely do.

The conflict between the two protection objectives is not merely possible but familiar. Fixing an orthography, freezing a technical standard, or codifying a craft into an examinable syllabus each preserves a state and each restricts the capacity to transform. Whether the trade is worth making is a substantive question the paper does not settle; what it establishes is that the question is unavoidable and that appeals to protecting a commons do not answer it.

The strongest objection is that some commons genuinely are stocks, so the thesis overgeneralizes. The reply accepts the restriction: the thesis is stated for generative commons and is what distinguishes them. A collection of documents in a repository is a stock, and the practice of reading, extending, and disputing those documents is not.

2.3 Realization Conditions

This subsection connects the commons object to the conditions through which it is realized, and states the scope restriction the paper inherits.

A practice is carried out through conditions: time, training, tools, venues, compute, funding, recognition, permission, and channels of distribution. These are scarce in ways the practice is not. Some are consumed by use, some degrade under load, some are controlled by identifiable parties, and some are constituted by relative standing and therefore cannot be expanded for everyone at once.

The companion diagnostic develops this taxonomy for individual participants and this paper does not repeat it. What matters here is the consequence for the commons as such: because $\mathcal{U}$ in Equation (1) takes $\mathcal{C}_t$ as an argument, the practice’s capacity to transform depends on conditions that are held separately from the practice. A commons can therefore be materially altered by parties who never participate in it.

3 Commons, Enclosure, and Collective Production

This section locates the paper among the traditions its problem engages. Its objective is bounded positioning: each supplies a constraint or a vocabulary, none supplies the process account or the attribution argument, and their disagreements are preserved.

3.1 Governance of Shared Resources

Ostrom’s analysis of common-pool governance establishes that communities can and do sustain shared resources through institutional arrangements that are neither private property nor central regulation [12]. Hess and Ostrom extend the framework to knowledge and treat the extension as an open programme [9]. Frischmann analyzes infrastructure as a class of shared resources whose social value derives substantially from the downstream activities they enable, and argues that managing such resources as commons can be efficient because the spillovers are difficult to appropriate [7].

Frischmann’s account is the closest antecedent for this paper’s object, since it treats a resource’s value as residing in what it enables rather than in what it contains. The difference is that infrastructure in his sense is a means to downstream production, while a generative commons is itself altered by the downstream activity. The present paper’s update relation has no counterpart there.

3.2 Enclosure of the Intangible

Boyle analyzes a second enclosure movement in which material formerly regarded as common or uncommodifiable is brought under new or newly extended property rights, and argues for a vocabulary adequate to describe the loss [5]. This supplies the paper’s central political-economic category and one of its cautions: enclosure is a description of a legal and institutional movement, and applying it requires identifying the specific rights extended rather than gesturing at a trend.

Benkler analyzes commons-based peer production as a mode of production in which value arises without proprietary exclusion or managerial direction [2]. This establishes that the generative commons is a site of production rather than merely of consumption, which the present paper requires and does not have to argue for itself.

3.3 Collective Production and Contributed Input

Marx’s discussion of the general intellect describes a condition in which social knowledge becomes a direct force of production, so that the productive power of a society is embodied in accumulated collective knowledge rather than in individual labor time [10]. This is the closest classical antecedent for the paper’s difficulty, since it locates productive power in something no individual produced. It supplies no allocation rule, and the present paper does not adopt the surrounding value theory, whose production-centered structure the companion diagnostic already declines [11].

Terranova analyzes free labor in digital economies, where activity that is freely given is simultaneously appropriated [17], and Couldry and Mejias analyze data appropriation as a colonial structure in which life is configured for continuous extraction [6]. Both describe the pattern in which broadly distributed contribution meets narrow capture. They establish that the pattern is real and contested; they do not settle what contributors are owed, which is the question this paper’s predicate separations address.

Gouldner’s analysis of the norm of reciprocity is relevant in a limited way [8]. Participation in a commons is frequently described as reciprocal, and the description is normatively loaded rather than neutral, so it cannot by itself establish that a commons relation is in good order.

Table 1: Traditions Engaged by the Generative-Commons Problem. No tradition reviewed supplies the update relation, the attribution argument, or the predicate separations. The third column records the constraint each imposes.

Tradition	What it supplies	Constraint imposed here
Common-pool governance [12]	Institutional sustenance of shared resources	Designed for subtractable units; transfer to generative practices is a programme, not a result
Knowledge commons [9]	Vocabulary of provision and appropriation for non-subtractable resources	The extension is treated as open by its own authors
Infrastructure and spillovers [7]	Value residing in what a resource enables	Infrastructure is a means to downstream activity; a generative commons is altered by it
Second enclosure [5]	Extension of property rights over the intangible	Applying the category requires naming the specific rights extended
Peer production [2]	Production without proprietary exclusion or managerial direction	Establishes the commons as a site of production; supplies no allocation rule
General intellect [10]	Productive power residing in accumulated collective knowledge	Locates the difficulty; supplies no allocation rule and carries a value theory not adopted here
Contributed input [17, 6]	Distributed contribution meeting narrow capture	Establishes the pattern; leaves open what contributors are owed
Reciprocity [8]	Reciprocity as a loaded stabilizing norm	Calling commons participation reciprocal is not neutral description
Exploitation accounts [14, 19, 18, 20]	Appropriation without a discrete transaction; structural and non-agential wrongs	A wrong to a practice requires separate treatment from a wrong to a person
Structural limitation [22]	Background injustice does not settle a transaction	Collective production does not make every appropriation wrongful

3.4 Exploitation and Structural Position

The exploitation traditions bear on the paper through their treatment of appropriation without a discrete transaction. Roemer’s withdrawal comparison defines exploitation against a counterfactual arrangement rather than against another party [14]; Wertheimer establishes that mutual benefit leaves the classification open [19]; Vrousalis locates the wrong in the instrumentalization of vulnerability [18]; and Wollner analyzes exploitation that is structural and non-agential [20], which is the closest available treatment of a wrong done to a practice rather than to a person.

Zwolinski’s constraint against inferring a transaction’s status from background injustice applies here with particular force [22]. A commons framing invites the inference that any appropriation from a collectively produced practice is thereby wrongful, and that inference would make the category vacuous.

Table 1 records what each tradition supplies and withholds.

4 Five Predicates and the Attribution Argument

This section argues the theses on which the paper depends. Each subsection states a thesis, argues for it, states the strongest objection known to the author, and replies.

4.1 Connectivity Is Not Contribution

This subsection addresses the relational-ontology challenge to isolated authorship.

The challenge is that relational coupling runs through arbitrarily long chains, so any participant is connected to any other through possibly high-order relations, and the claim that a particular participant created a practice is a localization rather than a fact about origination.

Thesis 4.1 (Connectivity without allocation). Path connectivity establishes that isolated authorship is an idealization and establishes no co-creator standing. An argument that yields the same verdict for every participant cannot ground a differential claim, so relational genesis is self-undermining when used to allocate.

The argument is short and, the author believes, decisive. Suppose connectivity sufficed for co-creator standing. Connectivity is universal by hypothesis, so standing would be universal. A predicate holding of everyone in a population supports no distinction within that population, and every question the argument was introduced to settle — who may govern, who is owed, who is wronged — is a question about distinctions within the population. So the argument cannot settle any of them. It is not that relational ontology is false; it is that its truth is allocatively inert.

What can differentiate is effective causal influence, which unlike connectivity admits degrees and thresholds. The distinction between the two is the first of several the following subsections require.

The strongest objection is that this proves too little, since a universal predicate can still have consequences: if everyone is a co-creator, perhaps everyone is owed something, and the equality of the claim is a feature. The reply concedes the coherence of that position and denies that connectivity supports it. A claim that everyone is owed something in virtue of connection requires a premise that connection generates entitlement, and that premise is exactly what is in dispute; connectivity supplies the connection and not the entitlement. Thesis 4.3 reaches a conclusion in that neighborhood by a different and, the author argues, sounder route.

4.2 Five Predicates Without Entailments

This subsection states the paper’s main analytical result.

Five predicates recur in arguments about commons, and arguments in this area frequently consist of sliding along them without noticing.

Thesis 4.2 (Predicate independence). Participation in a practice, contribution to it, standing to be wronged by what happens to it, authority to govern it, and ownership of it are five distinct predicates. No pair among them stands in an entailment relation in either direction.

Table 2 records each predicate with a case establishing that it comes apart from its neighbors. The cases are ordinary rather than exotic, which is the point: the independence is not a technicality but a description of how such practices actually work.

The consequence is that inferences of the form *everyone participates, therefore everyone contributes, therefore everyone has standing, therefore everyone should govern, therefore everyone owns* fail at every step. So do their converses, including the inference from ownership to authority that appears whenever a corpus holder claims to speak for a practice.

Three of the five are relational rather than distributive properties. Standing concerns who may be wronged, governance authority concerns who may decide, and both are constituted by the terms on which participants stand to one another rather than by any allocation of holdings. Anderson’s argument that egalitarian justice concerns the character of social relations in place of a purely

Table 2: Five Predicates and Separating Cases. Each row states what the predicate holds of and exhibits a case in which it holds while an adjacent predicate fails. The cases are schematic and classify no actual practice.

Predicate	What it holds of	Separating case
Participation	Carrying out the practice	A fluent speaker who coins nothing participates without contributing to what the language becomes
Contribution	Altering what the practice becomes	A coiner whose term is adopted after they have left the field contributes without participating further
Standing	Being liable to be wronged by what happens to the practice	A practitioner whose livelihood depends on a technique has standing regarding its foreclosure while having contributed nothing to it
Governance authority	Being entitled to decide the practice’s rules	A major contributor to a standard may hold no authority over the body that maintains it, and a maintainer may hold authority while contributing little
Ownership	Holding an exclusion right	A commons may have governance authority vested in a body that owns nothing, and an owner of a corpus may hold no authority over the practice built on it

distributive criterion applies directly [1], and it explains why a distributive question about shares cannot settle either of them.

The strongest objection is that the predicates, while distinct, are correlated strongly enough that the separations are edge cases with no practical consequence. The reply is that the correlations run in different directions in different practices, and that the cases where they come apart are precisely the contested ones. A dispute about a commons is rarely a dispute about a case where all five coincide.

4.3 Attribution Uncertainty and What Protection Attaches To

This subsection reconstructs the paper’s central normative argument.

The researcher-origin proposal is that the justification for protecting a commons runs through the ambiguity of attribution after entry, rather than through a claim that nobody created anything. The distinction matters, and the argument requires careful statement to avoid inferring a value from an ignorance.

Thesis 4.3 (Conditional protection of the continuing capacity). If a generative commons’ continuing capacity is valuable and something is to be protected, then attribution underdetermination makes the continuing capacity the remaining coherent object of protection, since it defeats decomposition into individual entitlements.

The argument has the form of a disjunctive elimination and should be read as one.

The first premise is that the commons’ continuing generative capacity is valuable. This is an independent claim, and the paper does not derive it from anything about attribution. It rests on the ordinary observation that participants can do things through a living practice that they could not do otherwise, which the capability literature articulates as the difference between what a person achieves and what a person is in a position to achieve [16, 13].

The second premise identifies two candidate objects to which protection might attach: a decomposition into individual entitlements reflecting each participant’s share, or the continuation of the capacity itself.

The third premise is that entry into a commons makes exclusive attribution progressively underdetermined. Equation (1) gives the mechanism: each state is produced from the previous state by the whole community of participants under conditions, so the contribution of any single participant to any later state is mediated through everything else that happened. This is a claim about a specific difficulty rather than about ignorance in general, and Proposition 6.2 states it precisely.

The conclusion follows: decomposition is defeated, so the continuing capacity is the remaining coherent object. And the conclusion is conditional in two respects that the thesis states explicitly. It is conditional on the value premise, which does the work that attribution uncertainty cannot do. And it is conditional on there being protection at all, since a third option always remains available, namely that nothing is protected. The argument establishes what protection must attach to if there is to be protection.

The strongest objection is that the argument licenses protecting anything whose ownership is unclear, which is absurd. The reply is that it does not, because uncertainty performs only the eliminative role. Nothing becomes valuable by being hard to attribute. If the first premise fails for some practice, the argument yields nothing for that practice, and the paper supplies no general reason to think the premise holds widely.

A second objection is that decomposition is not defeated but merely difficult, so an approximate decomposition might be preferable to protecting a capacity. The reply concedes that this is possible and identifies what it would require: a defensible approximation, an account of the errors it makes, and a reason to think those errors are tolerable. Section 8 records this as open rather than closed.

4.4 Wrongs to a Practice and Wrongs to Participants

This subsection identifies an object of harm the companion framework does not address.

Thesis 4.4 (Harm to the practice). A generative commons can be harmed in a respect not reducible to harm to any participant, since its capacity to transform can contract while every participant's individual position is unchanged at the time of the contraction.

The argument is temporal. Equation (1) makes the practice's next state depend on current conditions. A change in conditions can therefore remove states the practice could have reached while leaving every current participant's current capability intact, since those participants have not yet attempted to reach the removed states. The loss is real and is borne, if by anyone, by participants who do not yet exist or by present participants at a later time.

This is the commons analogue of an asymmetry the companion diagnostic states for individuals, and it is why the framework needs a level at which a practice is the object. Wollner's analysis of exploitation that is non-individual and non-agential is the closest verified treatment [20], and the responsibility that attaches in such cases is plausibly the forward-looking structural kind rather than liability for a discrete wrong [21].

The strongest objection is that a harm nobody bears is not a harm, so the thesis either reduces to harm to future participants or is empty. The reply accepts the first disjunct and denies that it is a reduction of the interesting kind. The harm is indeed borne by participants, including future ones; what the thesis denies is that it is identifiable at the time of the contraction by examining any current participant's position. That is a claim about the evidence and the timing rather than about the metaphysics of harm, and it has the practical consequence that participant-centered tests will systematically miss it.

4.5 Dependence of the Framework on the Theses

This subsection records what fails if each thesis is rejected.

Rejecting Thesis 2.1 returns the commons to a stock and removes the ambiguity in what protecting it means, which would make the paper’s central distinction otiose. Rejecting Thesis 4.1 permits relational genesis to ground allocation, which yields universal co-creator standing and therefore no allocation at all. Rejecting Thesis 4.2 permits the slide from participation to ownership, which is the most common bad argument in this area. Rejecting Thesis 4.3 leaves the protection of a commons without a stated object, so that appeals to protecting it remain ambiguous between the two candidates. Rejecting Thesis 4.4 confines the analysis to participant-level harms and loses the level at which enclosure of a practice is visible.

Theses 4.2 and 4.3 are load-bearing. Thesis 4.3 is the most contestable, since it moves from an epistemic premise to a conclusion about protection, and its conditional form is what keeps that move legitimate. Every proposition below survives the rejection of all five.

5 Enclosure Without Exclusion

This section develops the political-economic content. Its objective is to describe a mechanism by which a commons is enclosed while remaining formally open, and to state why access-based tests miss it.

5.1 The Mechanism

This subsection states how a practice contracts without anyone being shut out.

Because the update relation takes realization conditions as an argument, a party controlling those conditions can alter what the practice can become without altering anyone’s formal access to the practice itself. Compute, venues, funding, recognition, distribution, and permission are all held separately from a language, a technique, or a research tradition.

The resulting configuration is characteristic. Every participant retains the right to use the practice; every participant retains whatever they knew; and the set of states the practice can reach has contracted. Nobody was excluded, and the commons is smaller in the respect that constitutes it.

Boyle’s account of the second enclosure movement describes the extension of property rights over intangibles [5]. The present mechanism is adjacent and distinct: it requires no new right over the practice, only control of what the practice needs in order to be carried out at scale. A description limited to rights extension will not detect it.

5.2 Why Access Tests Miss It

This subsection states the diagnostic consequence.

An access-based test asks whether participants may use the practice. Under enclosure without exclusion the answer is yes, and the test returns nothing. What has changed is the reachable set in Equation (1), which no access test examines.

This is the commons form of a point the companion diagnostic makes for individuals, and it has the same practical implication: openness is compatible with foreclosure, so a regime that certifies openness certifies the wrong thing. Frischmann’s argument that infrastructure’s value lies in what it enables points in the same direction [7], since a resource can remain available while the conditions for using it productively are withdrawn.

5.3 Universal Input and Asymmetric Capture

This subsection addresses the configuration that motivated the research programme.

Where a capability is assembled from a broadly distributed practice and realized at scale under narrow control, two descriptions compete. On the first, everyone who contributed to the practice has been wronged, which Thesis 4.1 shows connectivity cannot establish and which Thesis 4.2 shows does not follow from participation. On the second, the practice itself has been enclosed, which Theses 4.4 and the mechanism above render intelligible.

The paper’s position is that the second description carries the weight the first is usually asked to carry. This does not entail that contributors are owed nothing; it locates the question elsewhere, in standing and in what the continuing capacity requires, rather than in a decomposition of historical contribution. Terranova’s analysis of freely given and simultaneously appropriated activity [17] and Couldry and Mejias’s account of extraction [6] describe the pattern; the account of what follows is this paper’s own and is conditional in the manner Thesis 4.3 states.

The rentiership vocabulary supplies the political-economic form of the control at issue, since returns accruing to control rights over conditions are exactly what the mechanism requires [3].

6 Formal Results

This section states the paper’s formal content. Its objective is to make three claims precise: that origin does not determine later states, that attribution degrades along the update, and that enclosure without exclusion is possible.

6.1 Declared Objects

Let $\mathfrak{G}$ be a set of practice states, $\mathcal{R}$ a set of participant communities with their interactions, and $\mathcal{C}$ a set of realization-condition profiles. Let the update correspondence be

$$\mathcal{U} : \mathfrak{G} \times \mathcal{R} \times \mathcal{C} \times \Xi \rightrightarrows \mathfrak{G},$$

with Ξ collecting unresolved influences, and let $G_{t+1} \in \mathcal{U}(G_t, \mathcal{R}_t, \mathcal{C}_t, \xi_t)$ as in Equation (1). Write the n -step reachable set from G_0 under a condition path $\mathcal{C}_{0:n-1}$ as

$$\mathcal{U}^n(G_0, \mathcal{R}_{0:n-1}, \mathcal{C}_{0:n-1}) = \{G_n : \exists \xi_{0:n-1}, G_{k+1} \in \mathcal{U}(G_k, \mathcal{R}_k, \mathcal{C}_k, \xi_k) \forall k\}.$$

6.2 Origin Does Not Determine Later States

Proposition 6.1 (Genealogical insufficiency). *For $n \geq 1$, knowledge of G_0 does not determine G_n . Where $\mathcal{U}$ is non-singleton at some reachable state, or where the condition path admits variation, the reachable set $\mathcal{U}^n$ contains more than one element.*

Proof. Immediate from the correspondence’s non-singleton values: if $|\mathcal{U}(G_k, \mathcal{R}_k, \mathcal{C}_k, \cdot)| > 1$ for some reachable G_k , two distinct continuations exist and both lie in $\mathcal{U}^n$. If $\mathcal{U}$ is single-valued but $\mathcal{C}_k$ admits two profiles yielding distinct successors, the same follows. $\square$

The proposition is elementary and its consequence is not. An origin claim about G_0 establishes something about G_0 and, by itself, nothing about any later state. A participant who originated a practice therefore has no claim over its later states that follows from origination alone, which is the formal form of the researcher’s observation that a commons evolves and that history is not static.

6.3 Attribution Degrades Along the Update

Proposition 6.2 (Attribution underdetermination). *Let $A_n(i)$ denote any attribution functional assigning participant i a share of G_n , and suppose A is required to be invariant under relabelings of the unresolved influences ξ . If for some reachable state the same G_{k+1} is attainable from G_k under two participant configurations differing in i 's activity, then $A_n(i)$ is not determined by the observed sequence $G_{0:n}$ for $n > k$.*

Proof. The hypothesis supplies two histories consistent with the same observed sequence and differing in i 's activity. Any functional determined by the observed sequence assigns them the same value, while any functional tracking i 's activity must distinguish them. No functional does both. $\square$

The proposition states precisely what the third premise of Thesis 4.3 requires. It is a non-identification result about a share, and it says nothing about whether the practice is valuable. It also does not assert that attribution is impossible in principle: it asserts that the observed sequence of practice states does not determine it, which is the situation attribution disputes about commons actually occupy.

6.4 Enclosure Without Exclusion

Proposition 6.3 (Repertoire contraction under preserved access). *There exist condition profiles $\mathcal{C}$ and $\mathcal{C}'$ such that every participant's formal permission to carry out the practice is identical under both, while*

$$\mathcal{U}^n(G_0, \mathcal{R}_{0:n-1}, \mathcal{C}'_{0:n-1}) \subsetneq \mathcal{U}^n(G_0, \mathcal{R}_{0:n-1}, \mathcal{C}_{0:n-1}).$$

Proof. Formal permission is one component of a condition profile. Take $\mathcal{C}'$ agreeing with $\mathcal{C}$ on that component and differing on a component required to reach some state, for instance a resource without which a class of transformations cannot be carried out. Every state requiring that resource is then absent from the reachable set under $\mathcal{C}'$, while permissions are unchanged. $\square$

The construction is trivial once the update takes conditions as an argument, and that is the substantive point. Enclosure without exclusion requires no exotic mechanism; it follows immediately from the fact that a practice is realized through conditions held separately from it.

One consequence deserves recording. Where the contracted reachable set is itself stable, the configuration reproduces a diminished practice period after period without any party continuing to act. The poverty-traps literature analyzes self-reinforcing configurations of that shape, in which mechanisms reproduce a low-level condition and no appropriation need be ongoing [4]. Whether a contracted commons can enter such a state, and whether restoring conditions would restore the reachable set or leave the practice at its diminished equilibrium, is unresolved and recorded in Section 8.

7 Countermodels

This section supplies cases discriminating the paper's claims. They are schematic and classify no actual practice.

Countermodel 7.1 (Preserved state, destroyed capacity). A practice is codified and its current content fully preserved, while the authority to alter it is vested in a body that declines all changes. Every item is retained and the reachable set collapses to a single state. This separates the two protection objectives of Thesis 2.1.

Countermodel 7.2 (Universal participation, differentiated standing). Every member of a population uses a language. One group’s professional practice depends on a technical register within it; another group’s does not. A change in conditions forecloses the register. Participation is universal and the loss is not, which is compatible with Thesis 4.1 and illustrates Thesis 4.2.

Countermodel 7.3 (Ownership without authority). A party holds exclusive rights over a corpus in which a practice is recorded, while the practice’s norms are maintained by a community with no rights over that corpus. The party owns and does not govern; the community governs and does not own. This separates two of the five predicates directly.

Countermodel 7.4 (Contraction invisible to participants). A condition change removes states the practice could have reached in later periods. No participant has yet attempted those states, so no participant’s current capability differs. A participant-level audit at the time of the change returns nothing, and the reachable set has contracted. This is Thesis 4.4 together with Proposition 6.3.

Countermodels 7.2 and 7.4 together establish the paper’s practical claim about instruments: a test asking who may use a practice and a test asking whether anyone is currently worse off both return negative findings in cases where the commons has been materially diminished.

8 Open Questions

This section collects unresolved questions by register.

8.1 Conceptual and Formal Questions

Open Problem 8.1 (Contribution threshold). Thesis 4.1 establishes that effective causal influence rather than connectivity must do the differentiating work, and supplies no threshold. What threshold on influence is defensible, and can it be stated without presupposing an attribution functional that Proposition 6.2 shows to be underdetermined?

Open Problem 8.2 (Approximate decomposition). Thesis 4.3 treats decomposition as defeated. Is an approximate decomposition available, what errors would it make, and are those errors tolerable relative to protecting a capacity?

Open Problem 8.3 (Identity of a practice across transformation). Equation (1) presumes that G_t and G_{t+1} are states of one commons. What continuity condition underwrites that identification, and what happens to standing and to protection claims when a practice divides?

8.2 Normative and Institutional Questions

Open Problem 8.4 (Who holds a claim on behalf of a practice). Thesis 4.4 identifies a harm to the practice. Standing to assert it is unresolved, and the natural candidates — current participants, a governance body, or a public authority — each raise the predicate confusions Thesis 4.2 warns against.

Open Problem 8.5 (Protecting a capacity institutionally). What institutional form protects a capacity to transform rather than a state? Instruments designed around access, disclosure, or preservation all target states, and whether a capacity-directed instrument is constructible is open.

Open Problem 8.6 (Obligations of condition holders). A party controlling realization conditions can contract a practice without participating in it. What, if anything, is owed by a party in that position, and does it differ from what is owed by a participant?

Open Problem 8.7 (Hysteresis after contraction). If a contracted reachable set becomes self-reproducing, restoring the withdrawn conditions may not restore the practice. Under what conditions is contraction reversible, and does a commons that has lost a class of transformations regain it when the conditions return?

8.3 Empirical Questions

No actual commons is classified here. The priority questions are whether the reachable set of any practice can be characterized well enough for Proposition 6.3 to be applied; whether a case exists in which formal access was preserved and a practice's transformation capacity demonstrably contracted; and whether participants themselves distinguish the two protection objectives of Thesis 2.1 when they defend a commons.

9 Limits and Revisable Research Program

This section consolidates the contribution and fixes the conditions under which the paper should be narrowed or withdrawn.

9.1 Contribution

The conceptual contribution is the constitution of a generative commons by its transformation capacity, with the consequent ambiguity in what protecting it means, and the five-predicate separation with its pairwise cases.

The argumentative contribution is the reconstruction of the attribution argument as a conditional disjunctive elimination, which preserves the researcher's normative move while blocking the inference from ignorance it superficially resembles.

The formal contribution is elementary: genealogical insufficiency, attribution underdetermination along the update, and enclosure without exclusion. Their elementary character is intended, since each states precisely why a tempting inference fails.

The paper supplies no ownership rule, no governance design, no contribution threshold, no institutional proposal, and no classification of any practice.

9.2 Defeat Conditions

The conceptual contribution loses support if generative commons turn out to be adequately modeled as stocks, so that the transformation capacity adds nothing; or if the five predicates prove so tightly correlated in practice that the separations never bear on a real dispute.

The attribution argument loses support if the value premise fails generally, in which case the conditional is satisfied vacuously; or if a defensible approximate decomposition is constructed, which would restore the eliminated disjunct.

The formal contribution loses support if the update relation cannot be specified for any practice at a useful level of description, which would make the reachable set unavailable and Proposition 6.3 inapplicable.

The paper's practical relevance loses support if no case can be found in which access was preserved while transformation capacity contracted, since that configuration is the one the analysis was built to make visible.

9.3 Deferred Questions

The edge-level diagnostic and its standing condition belong to a companion project, which this paper uses without restating. Propagation across relations, identification of capability objects, and the evaluation of closed configurations belong to three others. Recovery, remedy, and legal translation belong to projects not yet developed, and the paper’s use of the enclosure category extends no further than the mechanism stated in Section 5.

The resulting position is conservative. A generative commons is a practice sustained and altered by its participants under conditions held separately from it. Everyone within it co-produces its later states, and that fact allocates nothing. Attribution degrades along the update, which defeats decomposition without establishing any value. And the characteristic harm to such a commons requires no exclusion and shows up in no participant’s current position, which is why it is easy to miss and why an instrument that certifies openness certifies the wrong thing.

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